Enhancing Awareness in the Maritime Domain

By Vice Admiral John Morgan and Commander "Bud" Wimmer

Maritime Domain Awareness is all about generating actionable intelligence, the cornerstone of successful counterterrorist and maritime law enforcement operations.

Introduction

The challenges facing our Naval and Coast Guard forces have changed dramatically over the past decade and make the future security environment increasingly complicated and uncertain. This new environment, highlighted by the events of Sept. 11, 2001, shows that terrorists will exploit access to our open society, economy, and commercial systems to bring about damaging and potentially catastrophic effects on our homeland.

With a more globally connected economy and our nation's continued reliance on the global maritime environment for trade and commerce, ensuring a safe and secure maritime environment is critical to national security and economic well-being.

An emerging set of diverse, increasingly networked adversaries pose security challenges every bit as threatening as what we would encounter if confronted by a peer adversary. In addition to a few hostile or potentially hostile states — some armed with nuclear weapons — the United States is threatened by terrorists, a proliferation of illegal weapons, organized crime affiliates, drug traffickers and cyber outlaws.

Whereas the enemies of yesterday were predictable, homogeneous, rigid, hierarchical, and resistant to change; today's enemies are dynamic, unpredictable, diverse, fluid, networked and constantly evolving.

They benefit from the many technologies and materials that are readily available for sale on the world's illicit markets to disrupt systems and fabricate weapons of mass destruction (WMD). These enemies do not operate on conventional battlefields, but thrive in weak states and gray areas where terrorists ride the back of transnational crime.

To counter the multitude of threats presented by these conditions, we must deny our adversaries the use and exploitation of the maritime environment, including its transportation systems. The first step toward enhancing our Maritime Security is achieving increased awareness of activities in the maritime domain.

Enhancing Awareness

To achieve increased awareness, the Coast Guard, in partnership with the Navy and other agencies, is developing an initiative called Maritime Domain Awareness (MDA). The Navy has achieved MDA for years at the tactical level to dominate areas surrounding Carrier and Expeditionary Strike Groups, but in the context of the global war on terrorism (GWOT), MDA takes on a strategic dimension.

MDA is the collection, fusion and dissemination of enormous quantities of data — intelligence and information — drawn from U.S. joint forces, U.S. government agencies, international coalition partners and forces, and commercial entities. Eventually, the depth of information collected from these various sources will be weaved together to enrich a comprehensive common operating picture (COP) that is envisioned to be fully distributed among users with access to data that is appropriately classified.

The purpose of MDA is to generate *actionable* intelligence. Without actionable intelligence, counterterrorist or maritime law enforcement operations are seldom fruitful. With it, the range of options available to Navy and Coast Guard forces expands significantly to permit much more effective investigation and interdiction of potentially threatening vessels, either overseas or as they approach the United States.

Additionally, MDA acts as a key enabler for other critical security measures, such as the Proliferation Security Initiative, Container Security Initiative, United Nations sanctions enforcement, counternarcotic operations, and anti-piracy patrols. Response options available range from intensified surveillance and tracking, to Expanded Maritime Intercept Operations (E-MIO), to the application of lethal and non-lethal force, if necessary.

The ultimate goal of MDA, in the context of Homeland Security/Homeland Defense, is to identify threats as early — and distant from American shores as possible. This will buy time to determine an appropriate course of action.

The Navy and Coast Guard have defined MDA to be the effective understanding of anything associated with the global maritime environment that could impact the security, safety, economy or environment of the United States.

The Navy, with its significant maritime intelligence, collection, fusion and dissemination capabilities, plays a leading role within the Defense Department for developing MDA and orchestrating the process by which information is shared with coalition partners, and other agencies and departments of the U.S. government.

Sharing information is absolutely essential if this growing network is to effectively detect, identify and track the most dangerous threats, including terrorists, WMD, narcotics, piracy, mass migrations, and arms traffickers. Awareness generated through information sharing will enhance understanding of the global maritime environment, including adjacent ungoverned areas in which terrorists operate, thereby providing opportunities to deal with threats as far away from America's borders as possible.

MDA consists of two key components: information and intelligence. These components will combine in the COP to create a substantive, layered presentation of the global maritime environment. Numerous governmental and military organizations already possess a COP of some sort; however, no one source captures all of the maritime information needed or currently available.

The challenge will be to effectively integrate and fuse the various inputs to achieve the synergies offered by a comprehensive situational awareness picture, while being responsive to the information needs of participating agencies. Through the COP, specialists will eventually be able to monitor vessels, people, cargo and designated missions, areas of interest within the global maritime environment, access all relevant databases, and collect, analyze and disseminate relevant information. Efforts are underway to determine the capabilities existing COPs have to accomplish these tasks and to assess the complexity of integration.

For the foreseeable future, technological and fiscal constraints will not support global tracking of every vessel, nor would doing so be useful in of itself. Based on fused data, intelligence and information, the most threatening vessels will receive priority cueing in order to focus our assets in the right areas. As better, less expensive solutions are developed, we can improve our ability to achieve maritime transparency.

Potential Technological Solutions

Technological advances may offer solutions to a number of the most difficult challenges encountered in the MDA development effort. Areas where technology can directly contribute to enhancing MDA are in the improved detection and tracking of vessels and crafts in the global maritime environment; the ability to monitor the movement of people and cargo in the maritime environment; the development of a comprehensive COP; and enabling appropriate access to the myriad databases and information sources which can make valuable contributions in detection and prevention.

To enhance our ability to detect and track vessels and craft on the high seas, existing capabilities and new technologies are being examined to determine the most effective way to proceed. For example, large commercial vessels now carry a collision avoidance and harbor traffic control device called Automatic Identification System (AIS), which is analogous to Identification Friend or Foe (IFF) transponders fitted aboard commercial airliners.

Expanded maritime traffic networks could use this system to identify participating vessels overseas or approaching our shores. Also, sensing systems such as long-range, over the horizon radars; high-altitude, long-dwell unmanned aerial vehicles (UAV); lighter-than-air craft; oceanic surveillance buoys; and acoustic systems show great promise for enhancing our ability to detect vessels and craft in the open ocean environment.

Integral to enhancing MDA are screening technologies used for verification of shipments and people prior to their departure from foreign ports. Many of these technologies are being implemented by agencies such as the U.S. Customs and Border Patrol performing nonintrusive inspections.

Technologies under development include "smart boxes," which will have built-in sensors that can detect prohibited items, threatening substances, potential WMD materials and unauthorized entry.

As an enabler, technology will be instrumental in the development of the envisioned comprehensive Maritime Domain Awareness COP by permitting the fusion of various information and intelligence sources.

The information exchange between government agencies and with private industry, in particular, sharing common databases, is the real power behind a global Maritime Domain Awareness COP.

Developing, and in some cases restricting, the layers of information available in the COP pose daunting challenges. Initiatives in this area have been in motion for some time, for example, the development of the Law Enforcement Information

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Exchange (LiNX) program by the Naval Criminal Investigative Service, the FBI, and a number of state and local law enforcement agencies. Further advanced command and control tools and decision-making systems such as data-mining and anomaly detection software will serve as the backbone for a realistic and tailorable COP.

Capabilities discussed here are expected to feed end users at locations ranging from Coast Guard Sector Command Centers to Navy Fleet Headquarters to federal teams of Navy, Coast Guard and other law enforcement personnel.

Conclusion

Great strides can be made toward improving Maritime Domain Awareness through efforts to enable and enhance information sharing among governmental agencies and by incentivizing private industry participation. While the effort to enhance MDA is certainly built upon the many relationships needed to establish the free flow of relevant information and intelligence, developing technologies will provide the framework needed to achieve maximum situational awareness of all activities in the maritime domain that may adversely impact the national interests of the United States.

No doubt, there will be significant technological and policy challenges to overcome. But by leveraging existing capabilities and prudently focusing our technology development efforts, we can successfully chart a course through the tumultuous waters that comprise the current strategic environment and emerge a prosperous, more secure society.

Vice Admiral Morgan is Deputy Chief of Naval Operations for Information, Plans, and Strategy. Commander Wimmer works in the Strategy and Policy Division in the Office of the Chief of Naval Operations. CHIPS